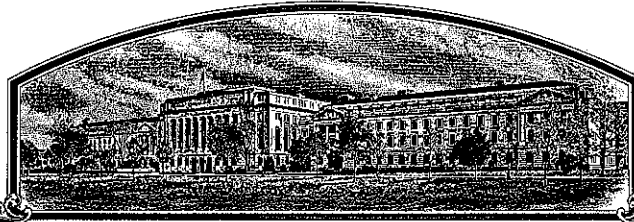


No.

9700045



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Western Plant Breeders

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BARLEY

'Nebula'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirty-first day of January, in the year of our Lord two thousand.

Attest:

Ann Marie
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Don H. ...
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(INSTRUCTIONS ON REVERSE)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Western Plant Breeders		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. DA 592-47		3. VARIETY NAME NEBULA	
4. ADDRESS (street and no. or R.F.D. no., city, state, ZIP, and country) 8111 Timberline Drive Bozeman, MT 59718		5. PHONE (include area code) (406) 587-1218		FOR OFFICIAL USE ONLY	
				PVPO NUMBER 9700045	
7. GENUS AND SPECIES NAME Hordeum vulgare		8. FAMILY NAME (Botanical) Poaceae		Filing and Examination Fee \$2450.00	
				Date Nov. 27, 1996	
9. CROP KIND NAME (Common Name) Barley		10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Corporation		Certificate Fee \$300	
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Arizona		12. DATE OF INCORPORATION August 24, 1990		Date 1/4/00	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS. Dr. Dale R. Clark Western Plant Breeders 8111 Timberline Drive Bozeman, MT 59718					
PHONE (include area code): (406) 587-1218					
FAX (include area code): (406) 586-8247					
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)					
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety					
b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness					
c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of the Variety					
d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety					
e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Applicant's Ownership					
f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or for tuber propagated varieties verification that tissue culture will be deposited and maintained in a public repository)					
g. <input checked="" type="checkbox"/> Filing and Examination Fee as prescribed in 97.175 of the regulations, made payable to "Treasurer of the United States" (Mail to PVPO)					
15. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act)?					
<input type="checkbox"/> YES (If "yes", answer items 16 and 17 below) <input checked="" type="checkbox"/> NO (If "no", skip to item 18 below)					
16. DOES THE APPLICANT SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?			17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?		
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			<input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED		
18. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?					
<input checked="" type="checkbox"/> YES (If "yes", give names of countries and dates) <input type="checkbox"/> NO					

December 10, 1995

19. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT (Owner(s))

CAPACITY OR TITLE

DATE

NAME (Please Print or Type)

Dale R. Clark

Barley and Wheat Breeder

Nov 26, 1996

SIGNATURE OF APPLICANT (Owner(s))

CAPACITY OR TITLE

DATE

NAME (Please Print or Type)

Dan R. Biggerstaff

General Manager

Nov 26, 1996

NEBULA

Exhibit A. Origin and Breeding History

Nebula is a six-rowed, semi-dwarf, spring, feed barley that was selected by Western Plant Breeders, Inc. from the cross - DA 587-71 x PH 585-6. Both lines were WPB selections from semi-dwarf, male sterile facilitated recurrent selection populations (MSFRSP's) that were bred for disease resistance in the central valleys of California. Initial populations were developed by crossing disease resistant lines from Composite Cross II onto male sterile plants in CC-XXXII. Disease resistant F3 plants from the original cross were crossed onto agronomically acceptable male sterile, semi-dwarf plants in CC-XXXII. This cycle was repeated three times, during which, the above mentioned lines were selected and yield tested. Both lines had deficiencies that made them unacceptable as stand-alone varieties. Therefore, the cross was made to bring the best traits together.

The cross was made in Western Plant Breeders' nursery near Phoenix, AZ in March of 1990 and the F1 was grown near Bozeman, MT during the summer of 1990. F2 heads were selected in May of 1991 near Phoenix. F3 rows were grown near Bozeman the summer of 1991. Single head selections were made from each F3 row and the seed planted near Davis, CA in November of 1991 as F4 rows. One row that had acceptable agronomic appearances was selected in early May of 1992 and designated DA 592-47. F5 seed was planted near Bozeman in May of 1992 and F6 seed harvested in October. This seed and the successive F7 through F9 generations were yield tested in 1993, 1994, 1995 and 1996 respectively, in Arizona, California, and the Pacific Northwest.

Heads were selected from an F7 plot near Phoenix in May of 1994 and planted as head rows near Bozeman. Uniform rows were harvested individually in October of 1994. Row-plots were planted near Yuma in November of 1994. Uniform plots were harvested and bulked to produce Breeders seed in April of 1995. This Breeders seed was planted on a 12 acre field near Bozeman in May of 1995. Subsequent production was harvested as Foundation, Registered and Certified seed in September of 1995 and given the name "Nebula". The first sale of Certified seed to growers occurred in December of 1995.

NEBULA

Seed of Nebula has a blue aleurone, however the gene for blue aleurone does not always show complete penetrance. Therefore seed on one spike may vary from blue to light blue to whitish in appearance. All seed when replanted will produce spikes with similar seed colors.

Nebula is a stable and uniform variety in agronomic appearance and performance across several generations (F6 through F9) and growing conditions. Other than the variation for aleurone color, no other variants are known to occur. Agronomic data to support this stability are found in Tables 1 through 10.

Exhibit B. Statement of Distinctness

Nebula is most similar to the variety "Fiesta". However, Nebula is 6 to 10 days later flowering ($t = 5.04$ w/6 df, $p < .01$) and 2 to 7 inches taller ($t = 4.58$ w/14 df, $p < .001$) than Fiesta. Also, Nebula has semismooth awns while Fiesta has rough awn, the glume hairs of Nebula are restricted to a band while the glumes of Fiesta are completely covered with hair, and Nebula has a blue aleurone while Fiesta has a white aleurone.

Exhibit C. Objective Description (see pages 5 and 6)

OBJECTIVE DESCRIPTION OF VARIETY
BARLEY (*HORDEUM VULGARE*)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

Western Plant Breeders, Inc.

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

8111 Timberline Drive
Bozeman, MT 59718

FOR OFFICIAL USE ONLY

PVPO NUMBER

9700045

VARIETY NAME OR TEMPORARY
DESIGNATION
NEBULAPlace the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (i.e. or) when number is either 99 or less or 9 or less.

1. GROWTH HABIT:

 1 = SPRING 2 = FACULTATIVE WINTER 3 = WINTER Early Growth: 1 = PROSTRATE 2 = SEMIPROSTRATE
3 = ERECT

2. MATURITY (50% Flowering):

 1 = EARLY (California Mariout) 2 = MIDSEASON (Betzes) 3 = LATE (Frontier)

<input type="text" value="6"/>	No. of days Earlier than	<input type="text" value="8"/>	} 1 = BETZES 2 = CALIFORNIA MARIOUT 3 = CONQUEST 4 = DICKSON 5 = PIROLINE 6 = PRIMUS 7 = UNITAN 8 = WestBred Gustoe 9 = WestBred 501
<input type="text" value="4"/>	No. of days Later than	<input type="text" value="9"/>	

3. PLANT HEIGHT (From soil level to top of head):

 1 = SEMIDWARF 2 = SHORT (California Mariout) 3 = MEDIUM TALL (Betzes) 4 = TALL (Conquest)

<input type="text" value="0"/> <input type="text" value="3"/>	Cm. Shorter than	<input type="text" value="10"/>	} 1 = BETZES 2 = CALIFORNIA MARIOUT 3 = CONQUEST 4 = DICKSON 5 = PIROLINE 6 = PRIMUS 7 = UNITAN 8 = WestBred Gustoe 10 = WestBred Medallion
<input type="text" value="0"/> <input type="text" value="8"/>	Cm. Taller than	<input type="text" value="8"/>	

4. STEM:

 Exertion (Flag to spike at maturity): 1 = 0 - 3 cm. 2 = 3 - 10 cm. Anthocyanin: 1 = ABSENT 2 = PRESENT
3 = 10 - 15 cm. NO. OF NODES (Originating from node above ground) Collar Shape: 1 = CLOSED 2 = V-SHAPED 3 = OPEN Shape of Neck: 1 = STRAIGHT 2 = SNAKY
4 = MODIFIED CLOSED OR OPEN 3 = OTHER (Specify)

5. LEAF:

 Basal leaf sheath (seedling): 1 = GLABROUS 2 = PUBESCENT Position of flag leaf (at boot stage): 1 = DROOPING
2 = UPRIGHT Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY MM. WIDTH (First leaf below flag leaf)
3 = WAXY CM. LENGTH (First leaf below flag leaf) Anthocyanin in leaf sheath: 1 = ABSENT 2 = PRESENT

6. HEAD:

 Type: 1 = TWO-ROWED 2 = SIX-ROWED Density: 1 = LAX 2 = ERECT (Not dense)
3 = ERECT (Dense) Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY
4 = OTHER (Specify) 3 = WAXY Lateral Kernels Overlap: 1 = NONE 2 = AT TIP Rachis (Hair on edge): 1 = LACKING 2 = FEW 3 = COVERED
3 = 1/4 - 1/2 OF HEAD

7. GLUME:

 Length: 1 = 1/3 OF LEMMA 2 = 1/2 OF LEMMA Hairs: 1 = NONE 2 = SHORT 3 = LONG
3 = MORE THAN 1/2 OF LEMMA Hair covering: 1 = NONE 2 = RESTRICTED TO MIDDLE 3 = CONFINED TO BAND 4 = COMPLETELY COVERED Awns: 1 = LESS THAN EQUAL TO LENGTH OF GLUMES 2 = EQUAL TO LENGTH OF GLUMES
3 = MORE THAN EQUAL TO LENGTH OF GLUMES Awn Surface: 1 = SMOOTH 2 = SEMISMOOTH 3 = ROUGH

8. LEMMA:

☐ 5 Awn: 1 = AWNLESS 2 = AWNLETS ON CENTRAL ROWS, AWNLESS ON LATERAL ROWS
 3 = SHORT ON CENTRAL ROWS, AWNLETS ON LATERAL ROWS 4 = SHORT (less than equal to length of spike)
 5 = LONG (longer than spike) 6 = HOODED

☐ 2 Awn Surface: 0 = AWNLESS 1 = SMOOTH 2 = SEMISMOOTH 3 = ROUGH

☐ 2 Teeth: 1 = ABSENT 2 = FEW 3 = NUMEROUS ☐ 1 Hair: 1 = ABSENT 2 = PRESENT

☐ 1 Shape of base: 1 = DEPRESSION 2 = SLIGHT CREASE 3 = TRANSVERSE CREASE ☐ 2 Rachilla Hairs: 1 = SHORT 2 = LONG

9. STIGMA:

☐ 2 Hairs: 1 = FEW 2 = MANY

10. SEED:

☐ 2 Type: 1 = NAKED 2 = COVERED ☐ 1 Hairs on Ventral Furrow: 1 = ABSENT 2 = PRESENT

☐ 4 Length: 1 = SHORT (8.0 mm.) 2 = SHORT TO MIDLONG (7.5 - 9.0 mm.) 3 = MIDLONG (8.5 - 9.5 mm.)
 4 = MIDLONG TO LONG (9.0 - 10.5 mm.) 5 = LONG (10.0 mm.)

☐ 4 Wrinkling of hull: 1 = NAKED 2 = SLIGHTLY WRINKLED 3 = SEMIWRINKLED 4 = WRINKLED

☐ 2 Aleurone Color: 1 = COLORLESS (White or Yellow) 2 = BLUE

☐ 0 ☐ 1 PERCENT ABORTIVE

☐ 4 ☐ 6 GMS. PER 1000 SEEDS

11. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

<input type="checkbox"/> 0 SEPTORIA	<input type="checkbox"/> 2 NET BLOTCH	<input type="checkbox"/> 0 SPOT BLOTCH	<input type="checkbox"/> 2 POWDERY MILDEW
<input type="checkbox"/> 1 LOOSE SMUT	<input type="checkbox"/> 1 BACTERIAL BLIGHT	<input type="checkbox"/> 0 COVERED SMUT	<input type="checkbox"/> 1 FALSE LOOSE SMUT
<input type="checkbox"/> 0 STEM RUST	<input type="checkbox"/> 1 LEAF RUST	<input type="checkbox"/> 0 SCAB	<input type="checkbox"/> 2 SCALD
<input type="checkbox"/> 0 AY	<input type="checkbox"/> 0 BSMV	<input type="checkbox"/> 1 BYDV	<input type="checkbox"/> 0 OTHER (Specify)

12. INSECT: (0 = Not tested, 1 = Susceptible 2 = Resistant)

<input type="checkbox"/> 0 GREEN BUG	<input type="checkbox"/> 0 ENGLISH GRAIN APHID	<input type="checkbox"/> 0 CHINCH BUG	<input type="checkbox"/> 0 ARMYWORM
<input type="checkbox"/> 0 GRASS HOPPERS	<input type="checkbox"/> 0 CERIAL LEAF BETTLE	<input type="checkbox"/> 0 OTHER (Specify)	
HESSIAN FLY RACES	<input type="checkbox"/> 0 GP	<input type="checkbox"/> 0 A	<input type="checkbox"/> 0 B <input type="checkbox"/> 0 C
	<input type="checkbox"/> 0 D	<input type="checkbox"/> 0 E	<input type="checkbox"/> 0 F <input type="checkbox"/> 0 G

13. CHEMICAL (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☐ 0 DDT ☐ 0 OTHER (Specify)

14. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	WestBred Gustoe	Seed size	Fiesta
Leaf size	Fiesta	Coleoptile elongation	Fiesta
Leaf color	Fiesta	Seedling pigmentation	Fiesta
Leaf carriage	Fiesta		

REFERENCES: The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

- Wiebe, G. A., and D. A. Reid, 1961, Classification of Barley Varieties Grown in the United States and Canada in 1958, Technical Bulletin No. 1224, U.S. Dept. of Agriculture.
- Reid, D. A., and G. A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests, Agriculture Handbook No. 338, U.S. Dept. of Agriculture. pp. 61 - 84.
- Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Dictionary.

COLOR: Nickerson's or any recognized color fan may be used to determine color of the described variety.

NEBULA

Table 1. Yield, in pounds per acre, of Nebula and currently grown varieties in Western Plant Breeder's trials from 1992 through 1996.

<u>Location</u>	<u>Nebula</u>	<u>Fiesta</u>	<u>WestBred Gustoe</u>	<u>WestBred Barcott</u>	<u>UC 476</u>	<u>UC 828</u>
<u>1993</u>						
Phoenix, AZ	7540	5694	5946	5907	5500	
Davis, CA	6380	5259	3557	4195	4698	
<u>1994</u>						
Phoenix, AZ	8681	7327	8526	7231		
Phoenix (late planting)	6434	5355	7403	5931		
Davis, CA	6090	4485	2803	3673		
Sacramento, CA	6825	5259	3905	4679		
San Joaquin, CA	5085	5336	3712	3905		
Yuma, AZ	6380	6380	6322	5626		
<u>1995</u>						
Phoenix, AZ	6573	5761	6999	4563		6303
Phoenix (late planting)	7938	5735	8107	6486		7405
<u>1996</u>						
Phoenix, AZ	6902	5742	7134	5858		6457
Phoenix (late planting)	6824	5808	7187	6389		6383
Davis, CA	Lost These Nurseries Due To Karnal Bunt Hysteria					
Sacramento, CA						
San Joaquin, CA						
Yuma, AZ						
mean	6804	5678	5967	5370		6637

NEBULA

Table 2. Plant height, in inches, of Nebula and currently grown varieties in Western Plant Breeder's trials from 1992 through 1996.

<u>Location</u>	<u>Nebula</u>	<u>Fiesta</u>	<u>WestBred Gustoe</u>	<u>WestBred Barcott</u>	<u>UC 476</u>	<u>UC 828</u>
<u>1993</u>						
Phoenix, AZ	38	41	38	45	41	
Davis, CA	38	32	30	31	39	
<u>1994</u>						
Phoenix, AZ	37	33	27	38		
Phoenix (late planting)	33	30	32	31		
San Joaquin, CA	34	30	30	34		
<u>1995</u>						
Phoenix, AZ	37	37	36	39		38
Phoenix (late planting)	36	35	35	37		33
<u>1996</u>						
Phoenix, AZ	35	29	30	32		34
Phoenix (late planting)	<u>27</u>	<u>28</u>	<u>29</u>	<u>27</u>		<u>29</u>
mean	35	33	32	35		34

NEBULA

Table 3. Test weight, in pounds per bushel, of Nebula and currently grown varieties in Western Plant Breeder's trials from 1992 through 1996.

<u>Location</u>	<u>Nebula</u>	<u>Fiesta</u>	<u>WestBred Gustoe</u>	<u>WestBred Barcott</u>	<u>UC 476</u>	<u>UC 828</u>
<u>1993</u>						
Phoenix, AZ	55	56	50	49	51	
Davis, CA	53	53	46	46	51	
<u>1994</u>						
Phoenix, AZ	57	55	55	53		
Phoenix (late planting)	50	52	51	48		
Davis, CA	53	54	48	49		
Sacramento, CA	53	55	48	48		
San Joaquin, CA	50	52	47	44		
<u>1995</u>						
Phoenix, AZ	54	54	52	49		51
Phoenix (late planting)	53	54	53	52		49
<u>1996</u>						
Phoenix, AZ	56	55	55	52		49
Phoenix (late planting)	<u>54</u>	<u>55</u>	<u>53</u>	<u>51</u>		<u>48</u>
mean	53	54	51	49		49

NEBULA

Table 4. Heading date, in Julian days, of Nebula and currently grown varieties in Western Plant Breeder's trials from 1992 through 1996.

<u>Location</u>	<u>Nebula</u>	<u>Fiesta</u>	<u>WestBred Gustoe</u>	<u>WestBred Barcott</u>	<u>UC 476</u>	<u>UC 828</u>
<u>1993</u>						
Phoenix, AZ	80	77	87	69	84	
<u>1994</u>						
Phoenix, AZ	77	74	83	66		
<u>1995</u>						
Phoenix, AZ	77	70	82	63		78
Phoenix (late planting)	84	77	91	77		85
<u>1996</u>						
Phoenix, AZ	<u>74</u>	<u>60</u>	<u>75</u>	<u>57</u>		<u>77</u>
mean	78	72	84	66		80

NEBULA

Table 5. Yield, in pounds per acre, of Nebula and currently grown check varieties in Univ. of California Extension yield trials for 1995 and 1996.

<u>Location</u>	<u>Nebula</u>	<u>Fiesta</u>	<u>UC 337</u>	<u>UC 603</u>	<u>UC 828</u>
<u>1995</u>					
Davis	6830	2590	5240	5390	5340
Merced	4110	3050	4240	3760	3550
Kings	5070	3210	4570	4400	3880
<u>1996</u>					
Davis	3950	2280	2190	5100	2850
Merced	3540	3240	3360	4720	3390
Sutter	<u>3620</u>	<u>1960</u>	<u>3240</u>	<u>4210</u>	<u>3640</u>
mean	4520	2722	3807	4597	3775

NEBULA

Table 6. Plant height, in inches, of Nebula and currently grown check varieties in Univ. of California Extension yield trials for 1995 and 1996.

<u>Location</u>	<u>Nebula</u>	<u>Fiesta</u>	<u>UC 337</u>	<u>UC 603</u>	<u>UC 828</u>
<u>1995</u>					
Davis	40	33	45	35	35
Merced	42	35	42	40	36
Kings	40	35	39	38	43
<u>1996</u>					
Davis	44	38	48	40	42
Merced	46	37	48	39	42
Sutter	<u>34</u>	<u>27</u>	<u>41</u>	<u>34</u>	<u>37</u>
mean	41	34	44	38	39

NEBULA

Table 7. Test weight, in pounds per bushel, of Nebula and currently grown check varieties in Univ. of California Extension yield trials for 1995 and 1996.

<u>Location</u>	<u>Nebula</u>	<u>Fiesta</u>	<u>UC 337</u>	<u>UC 603</u>	<u>UC 828</u>
<u>1995</u>					
Davis	48	47	46	47	44
Merced	45	48	48	42	41
Kings	50	53	49	50	46
<u>1996</u>					
Davis	43	43	42	48	41
Merced	43	45	43	47	43
Sutter	<u>41</u>	<u>43</u>	<u>43</u>	<u>49</u>	<u>43</u>
mean	45	47	45	47	43

NEBULA

Table 8. Heading date, in Julian days, of Nebula and currently grown check varieties in Univ. of California Extension yield trials for 1995 and 1996.

<u>Location</u>	<u>Nebula</u>	<u>Fiesta</u>	<u>UC 337</u>	<u>UC 603</u>	<u>UC 828</u>
<u>1995</u>					
Davis	110	99	105	101	107
<u>1996</u>					
Davis	<u>105</u>	<u>96</u>	<u>101</u>	<u>97</u>	<u>102</u>
mean	108	98	103	99	105

N E B U L A

Table 9. Agronomic characteristics of Nebula compared to check varieties in the 1995 Western Regional Spring Barley Nursery (summary of 12 locations).

<u>Variety</u>	<u>Yield (lbs/ac)</u>	<u>Test Wt. (lbs/bu)</u>	<u>Plt. Ht. (inches)</u>	<u>Heading Date (Julian)</u>
Nebula	5530	48	26	184
Step toe	5174	48	30	178
Harrington	4995	51	33	183
Excel	4906	50	33	180
Klages	4728	51	34	185
Foster	4728	50	34	180
Morex	4015	50	36	179

NEBULA

Table 10. Agronomic characteristics of Nebula compared to check varieties
in the Univ. of Arizona 1996 Small Grains Variety Evaluation Trial.

	Yield <u>lbs/ac</u>	T.W. <u>lbs/bu</u>	Plt. Ht <u>inches</u>	Lodging <u>%</u>	Heading Date <u>from Mar. 1</u>	Maturity <u>from Ap. 1</u>
<u>Maricopa</u>						
Nebula	6348	56.9	35	34	2	19
Max	6223	53.8	32	68	10	23
Gustoe	5531	51.5	31	78	8	20
Mucho	3947	50.6	30	72	-8	5
Barcott	3352	54.3	35	66	-8	-2
 <u>Gila Bend</u>						
Nebula	5859	53.5	30			
Max	5689	52.1	26			
Gustoe	5205	53.2	26			
Mucho	5407	50.8	25			
Barcott	5441	51.4	31			

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Western Plant Breeders, Inc.	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER DA 592-47	3. VARIETY NAME NEBULA
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) 8111 Timberline Drive Bozeman, MT 59718	5. TELEPHONE (include area code) (406) 587-1218	6. FAX (include area code) (406) 586-8247
8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. <div style="text-align: right;"><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</div>		
9. Is the applicant (individual or company) a U.S. national or U.S. based company? If no, give name of country _____ <div style="text-align: right;"><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</div>		
10. Is the applicant the original breeder? If no, please answer the following: <div style="margin-left: 20px;">a. If original rights to variety were owned by individual(s): Is (are) the original breeder(s) a U.S. national(s)? If no, give name of country _____ <div style="text-align: right;"><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</div></div> <div style="margin-left: 20px;">b. If original rights to variety were owned by a company: Is the original breeder(s) U.S. based company? If no, give name of country _____ <div style="text-align: right;"><input type="checkbox"/> YES <input type="checkbox"/> NO</div></div>		
11. Additional explanation on ownership (If needed, use reverse for extra space):		

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original breeder, both the original breeder and the applicant must meet one of the above criteria.

The original breeder may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

Public reporting burden for this collection of information is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your letter.

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